Shri Mata Vaishno Devi University, Katra

School of Electronics & Communication Engineering

B. Tech. (E&CE) Minor / Major Examination (Even Semester) 2018-19

Entry No. 17BEC033 Date: 04/02/2019

Course Title: Microprocessor Systems / Microprocessors & Microcontrollers

Course Code: ECL 2060/2062

Time Allowed: 1 ½ Hours Max Marks: [20]

i. Attempt All Questions. ii. Make Assumptions as needed

Q1. **Answer the following in brief: (5 x 1 = 05 Marks)**

(a) How many times will the DCR instruction be executed in the following program? Why? CO1

```
      LXI H, 3000H
Again: DCR L
      JNZ Again
```

(b) What will be the contents of AC (Auxiliary Carry Flag) after execution of following? CO1

```
MVI A, 7DH
SUI 0FH
```

(c) What will be the contents of CY (Carry Flag) after execution of following? Why? CO1

```
MVI A, 7DH
MVI B, 5FH
STA 2010H
```

(d) Draw a properly labeled Timing Diagram of a typical Memory Write cycle of 8085. CO1

(e) Draw circuit diagram showing the de-multiplexing of the Multiplexed Address Data Bus of 8085 µ-processor. CO2

Q2. Write a program in 8085 Assembly language to compare the two bytes stored at memory location 3000H & 3001H and store 00H at 3002H if both the numbers are equal else store 01H at 3002H. **(03 Marks)** CO3

Q3. (a) Design and draw circuit diagram showing the interface of one 8KB ROM & one 8 KB RAM with 8085 µ-processor with starting address of ROM at 0000H. **(03 Marks)** CO2

(b) Write a program in 8085 Assembly language to perform the subtraction of a 16 bit number stored at 3000H (LSB) & 3001H (MSB) from another 16 bit number stored at 3002H(LSB) & 3003H (MSB) and store the 16 bit result at 3004H (LSB) & 3005H (MSB). **(03 Marks)** CO3

Q4. Draw properly labeled Timing diagram illustrating the status of the various buses and important control signals for the fetch and execute cycle for the following 8085 instructions: LDA 2030H. Assume that this instruction is stored starting from memory location 0000H. **(03 Marks)** CO1

Q5. Write a program in 8085 Assembly language to copy 16 bytes of data starting from memory location 4000H to memory location starting from 3000H in reverse (Data from 4000H to 300FH, 4001H to 300EH and so on) while storing 00h in the 16 source locations from 4000H. **(03 Marks)** CO3

Course Outcomes

CO No.	CO Description	Questions Mapping	Total Marks
CO1	Identify detailed Hardware and functional architecture of 8085 µ-processor and 8051 µ-controller along with their instruction set	1(a, b, c, d), 4	07
CO2	Design and analyze hardware interface circuits for various applications using 8085 µ-processor and 8051 µ-controller along with various peripherals	1(e), 3(a)	04
CO3	Design and write software in Assembly language and Embedded C for applications which use 8085 µ-processor and 8051 µ-controller	2, 3(b), 5	09

Shri Mata Vaishno Devi University, Katra

School of Electronics & Communication Engineering

B. Tech. (E&CE) Minor-II (Even Semester) 2018-19

Entry No. 17BEC033 Date: 17/03/2019

Course Title: Microprocessor Systems / Microprocessors & Microcontrollers / Microprocessor & Interface

Course Code: ECL 2060/2062/2061

Time Allowed: 1 ½ Hours **Max Marks: [20]**

i. **Attempt All Questions. ii. Make Assumptions as needed**

Q1. **Answer the following in brief: (4 x 1 = 04 Marks)**

(a) Calculate the number of T-states in the execution of this program snippet. CO3

```
    LXI H, 0200H
Again: DCR L
    JNZ Again
    DCR H
    JNZ Again
```

(b) Write the initialization code snippet to configure the interrupts in 8085 µ-processor such that Interrupt RST 7.5 is disabled while Interrupt RST 5.5 & 6.5 are enabled. CO3

(c) Write the Interrupt Vector Address of the INTR interrupt of 8085. CO1

(d) What will be the contents of SP register at completion of following snippet: CO3

```
LXI SP, 27FFH
CALL 1000H
HLT
```

Q2. Write a program in 8085 Assembly language to find out the highest and smallest numbers out of the 10 numbers already stored starting from 3000H. For this purpose, two sub-routines called HIGHEST and LOWEST are called in the main program which find and store the Highest number at 3100H & find and store the lowest number at 3102H. Write the Main program and the two sub-routines. Make assumptions as needed. **(04 Marks)** CO3

Q3. Design and draw circuit diagram showing the interface of one 8KB ROM, one 4KB ROM & two 2 KB RAM with 8085 µ-processor with starting address of ROM at 0000H while the address of RAM should start from 8000H. **(04 Marks)** CO2

Q4. Two sensors circuit have been designed such that one of them generates a pulse whenever the person wearing them climbs up a stair by 1 step while the other sensor circuit generates a pulse whenever the person wearing them comes down the stair by 1 step. Draw a block schematic of 8085 µ-processor based circuit using which we can see at memory location 4300H the actual number of steps high the person wearing them is on the stairs. Show block diagram of hardware design and write software in assembly language of 8085 µ-processor for implementation of same. Use interrupts. **(01+04=05 Marks)** CO3

Q5. Write a Delay subroutine in 8085 assembly language which generates a delay of 220 µs if the data at memory location 4100H is DCH or generates a delay of 110 µs if the data at memory location 4100H is 6AH. Assume that crystal frequency is 6MHz. **(03 Marks)** CO3

Course Outcomes

CO No.	CO Description	Questions Mapping	Total Marks
CO1	Identify detailed Hardware and functional architecture of 8085 µ-processor and 8051 µ-controller along with their instruction set	1(a, b, c, d), 4	07
CO2	Design and analyze hardware interface circuits for various applications using 8085 µ-processor and 8051 µ-controller along with various peripherals	1(e), 3(a)	04
CO3	Design and write software in Assembly language and Embedded C for applications which use 8085 µ-processor and 8051 µ-controller	1(a, b, d), 2, 4, 5	15

Shri Mata Vaishno Devi University, Katra

School of Electronics & Communication Engineering

B. Tech. (E&CE) Major (Even Semester) 2018-19

Entry No. 17BEC033 **Date:** 06/05/2019

Course Title: Microprocessor Systems ECL 2060

Time Allowed: 3 Hours **Max Marks: [50]**

i. Attempt All Questions. ii. Make Assumptions as needed iii) Crystal 11.0592MHz for 8051

Q1.	**Answer the following in brief: (7 x 1 = 07 Marks)** (a) Calculate the delay generated because of following code snippet assuming crystal of 6MHz. LDA 3000H Again: DCR A NOP JNZ Again (b) Write the structure of RIM instruction of 8085 µ-processor. (c) Show the list of Interrupts of 8051 µC along with Vector Addresses in ascending level of priority (d) PSEN signal is activated in 8051 when _____ (e) If EA pin of 8051 is connected to ground then after reset the first instruction is fetched from _____ (f) Why is de-bouncing of key required when interfaced to µ-processor? (g) Write down the steps executed in response to POP H instruction in 8085 assembly language.	CO3 CO1 CO1 CO1 CO1 CO2 CO2
Q2.	a) Draw Port Structure of P2 of 8051 and show how it can function as a Port as well as Address-Data Bus. **(2 ½ Marks)** b) Write code snippet in Embedded C for 8051 µC to Enable all interrupts in 8051 but mask the Serial Port Interrupt. **(2 ½ Marks)**	CO3 CO3
Q3.	a) Draw circuit diagram illustrating interface of ADC 0808 to 8051 with proper labeling of signals. Write code in embedded C to read and convert the analog voltage at Analog channel 0 & Analog Channel 7, 10 times and store the converted values starting from 3000H for Channel 0 and starting from 300AH for Channel 7. **(2 ½ + 2 ½ =05 Marks)** b) Draw circuit diagram illustrating interface of one switch and two LEDs to 8051 port. Write code (C or Assembly) such that LED1 turns ON if switch is pressed and LED2 turns ON when switch is not pressed. **(2 ½ + 2 ½ =05 Marks)**	CO2/ CO3 CO2/ CO3
Q4.	a) Design and draw circuit diagram showing the interface of two 4KB ROMs, & three 2 KB RAM with 8085 µ-processor with starting address of ROM at 0000H while the address of RAM should start from A000H. **(03 Marks)** b) Write code in Embedded C to transmit 10 bytes of data starting from memory location 3000H @ 4800 baud in a frame of 10 bits. Make necessary assumptions. **(03 Marks)** c) Draw properly labeled Timing diagram illustrating the status of the various buses and important control signals for the fetch and execute cycle for the 8085 instruction LDAX B. Assume that this instruction is stored starting from memory location 3000H. **(03 Marks)**	CO2 CO3 CO1
Q5.	a) Write a sub-routine in 8085 Assembly language to find the 16 bit sum of five 16 bit numbers stored starting from memory location 3000H till 3009H and store the sum at 3009H & 300AH. **(05 Marks)** b) Write briefly about the Interrupt Architecture of 8085 processor. **(05 Marks)** c) Draw circuit diagram to show the interface of 01 Key to RST 5.5 and another key to RST 6.5 interrupts of 8085 µprocessor. Write Code in 8085 assembly language such that pressing of the key at RST 5.5 results in increase in count at memory location 3000H by 2 while pressing key at RST 6.5 reduces the count at 3000H by 1. **(2 ½ + 2 ½ =05 Marks)**	CO3 CO1 CO2/ CO3
Q6.	a) Write code in embedded C to generate a delay of 55µs using Timer of 8051µC. **(02 Marks)** b) Write about the Low power modes available in 8051 µC and the role of PCON Register. **(02 Marks)**	CO3 CO3

Course Outcomes

CO No.	CO Description	Questions Mapping	Total Marks
CO1	Identify detailed Hardware and functional architecture of 8085 µ-processor and 8051 µ-controller along with their instruction set	1(b, c, d, e), 4(c), 5(b)	12
CO2	Design and analyze hardware interface circuits for various applications using 8085 µ-processor and 8051 µ-controller along with various peripherals	1(f, g), 3, 4(a), 5(c)	12 ½
CO3	Design and write software in Assembly language and Embedded C for applications which use 8085 µ-processor and 8051 µ-controller	1(a), 2, 3, 4(b), 5(a, c), 6	25 ½